

**REMARKS**

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-13 were pending. By the present response, claim 1 has been amended and claims 14-17 have been added. Thus, upon entry of the present response, claims 1-17 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found at least at the following locations in the original disclosure: page 7, line 25 through page 9, line 16 of the specification; and the original claims.

***OBJECTION TO THE ABSTRACT***

The Abstract stands objected to on the grounds set forth in paragraph 6 of the Official Action. By the present response, a substitute Abstract has been presented which is believed to overcome the above-noted objection. Reconsideration and withdrawal of the objection is respectfully requested.

***REQUEST TO AMEND SPECIFICATION***

It was requested in paragraph 7 of the Official Action that the specification be amended to include a reference to the international application from which the present U.S.

national phase application is derived. By the present response, Applicants have adopted the Examiner's suggestion and amended the specification accordingly.

***CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)***

Claims 1-10 stand rejected under 35 U.S.C. §103(a) as being obvious over EP 0 498 689 to Collin et al (hereafter "*Collin et al.*") in view of EP 0 581 622 to Braconnier (hereafter "*Braconnier*") on the grounds set forth in paragraph 2 of the Official Action. This rejection is respectfully traversed.

The present invention is directed to a rare earth phosphate sol, and a process for preparing the same.

A sol composed according to the principles of the present invention is set forth in amended claim 1. Amended claim 1 recites

1. *A sol, comprising:*
  - *an aqueous phase;*
  - *particles of a phosphate of one rare earth consisting of cerium;*
  - *an acid other than phosphoric acid, a cerium of which is soluble in water.*

A process for preparing a sol carried out according to the principles of the present invention is defined by claim 6. Claim 6 recites:

6. *A process for preparing a sol of a phosphate of at least one rare earth selected from the group consisting of cerium and lanthanum according to claim 1, comprising the following steps:*
  - *mixing a solution of salts of at least one of said rare earths with phosphate ions in a  $PO_4^{3-}$ /rare earth mole ratio of more than 1 with control of the pH of the reaction medium to a value of more than 2;*

- *then ageing the precipitate obtained if the value of the pH of the reaction medium is in the range 2 to 6;*
- *separating the precipitate from the reaction medium;*
- *re-dispersing said precipitate in water;*
- *adding at least one salt of said rare earth and said acid to the dispersion in a quantity such that the final  $PO_4^{3-}$ /rare earth mole ratio in the dispersion is equal to 1.*

According to a further aspect, a process for preparing the sol according to the principles of the present invention is set forth in claim 7. Claim 7 recites:

7. *A process for preparing a sol of a phosphate of at least one rare earth selected from cerium and lanthanum according to claim 1, comprising the following steps:*

- *continuously introducing, with stirring, a first solution of salts of at least one of said rare earths into a solution containing phosphate ions and with an initial pH of less than 2; the phosphate ions being present in a quantity such that the  $PO_4^{3-}$ /rare earth mole ratio is more than 1;*
- *controlling the pH of the reaction medium to a substantially constant value of less than 2 during precipitation;*
- *separating the precipitate from the reaction medium;*
- *re-dispersing said precipitate in water;*
- *adding at least one salt of said rare earth and said acid to the dispersion obtained in a quantity such that the final  $PO_4^{3-}$ /rare earth mole ratio in the dispersion is 1.*

According to a further aspect, a sol composed according to the principles of the present invention is defined by newly presented claim 14. Claim 14 recites:

14. *A sol, comprising:*

- *an aqueous phase;*
- *particles of a phosphate of one rare earth consisting of lanthanum;*
- *an acid with a  $pK_a$  of at least 3, other than phosphoric acid, a lanthanum salt of which is soluble in water.*

Neither *Collin et al.* nor *Braconnier*, taken alone or in combination, disclose or suggest certain aspects of the presently claimed invention.

*Collin et al* is directed to mixed phosphate particulates, and methods for their preparation. More particularly, *Collin et al.* is directed to the formation and recovery of a mixed phosphate precipitate. Thus, *Collin et al.* fails to disclose a sol of any type. Moreover, *Collin et al.* teaches the formation of a mixed phosphate. By contrast, the presently claimed invention is directed to a sol, as well as a method for forming such sols.

In addition, as acknowledged in paragraph 2 of the Official Action, *Collin et al.* fails to disclose or even suggest any of the recited process steps following precipitation.

Finally, it is noted, with respect to claims 1 and 14, that the presently claimed invention is no longer directed to a sol containing a mixed phosphate. Rather, claim 1 is directed to a sol containing a cerium phosphate particulate, while claim 14 is directed to a sol containing a lanthanum phosphate particulate.

For at least the above-noted reasons, *Collin et al.* fails to disclose or suggest the subject matter of the presently claimed invention.

*Braconnier* is directed to a granular rare earth phosphate and methods for producing the same. As with *Collin et al.*, *Braconnier* is not directed to a sol, or methods for forming such sols. The granular phosphate described by *Braconnier* is the precipitate formed by the chemical reactions described therein.

It is asserted in paragraph 2 of the Official Action that *Braconnier* teaches that it is advantageous to "redisperse" the precipitate in water. This assertion is respectfully traversed. Column 5, line 57 through column 7, line 16 of *Braconnier* is cited in paragraph 2 of the Official Action in support of the above-noted assertion. However, a review of this portion of

the *Braconnier* disclosure does not reveal any apparent suggestion of redispersing a precipitate in water. Rather, the above-cited portion of the *Braconnier* disclosure is directed to various aspects of the precipitation reaction. Nowhere does *Braconnier* appear to suggest recovery of a precipitate, and then redispersing the recovered precipitate in water as alleged. Moreover, *Braconnier* certainly does not disclose or suggest the formation of a stable sol as recited by the presently claimed invention.

*Braconnier* is also cited as teaching the use of nitric acid "in the starting reaction mixture of *Collin et al.*" However, even if the teachings of the *Braconnier* were combined with *Collin et al.* in the manner suggested above, the claimed invention would not result. Namely, the use or addition of nitric acid to the reactant mixture of *Collin et al.*, which is the initial solution used to form the precipitate, would not result in a sol containing nitric acid as required by the presently claimed invention. In other words, the particles contained in the sol recited by the presently claimed invention are those particles which are recovered from, for example, a precipitate reaction, then added to an aqueous phase, and an acid to form a subsequent stable sol. Thus, whether or not it would have been obvious to utilize nitric acid in the precipitate reaction mixture does not specifically address the issue as to whether or not it would have been obvious to form a stable sol including nitric acid as required by the presently claimed invention.

For at least the reasons noted above, reconsideration and withdrawal of the rejection is respectfully requested.

Claims 2-10 depend from claim 1. Thus, claims 2-10 are also distinguishable over *Collin et al.* and *Braconnier* for at least the same reasons noted above.

Claim 11 stands rejected under 37 U.S.C. §103(a) as being obvious over *Collin et al.* in view of *Braconnier* as applied to claim 1-10 above, and further in view of U.S. Patent No. 4,942,697 to Khaladji et al. (hereafter "*Khaladji et al.*") on the grounds set forth in paragraph 3 of the Official Action. This rejection is respectfully traversed.

*Khaladji et al.* is directed to rare earth solid particulate compositions obtaining by calcining precipitates formed via chemical reaction. *Khaladji et al.* is cited as allegedly teaching the use of the materials taught by *Collin et al.* and *Braconnier* as polishing suspensions. However, even if the proposed combination were appropriate, the claimed invention would not result. Namely, the teachings of *Khaladji et al.* are insufficient to cure the previously noted deficiencies noted in connection with the principle combination of *Collin et al.* with *Braconnier*. Thus, reconsideration and withdrawal of the rejection is respectfully requested.

Claim 12 stands rejected under 35 U.S.C. §103(a) as being obvious over *Collin et al.* in view of *Braconnier* as applied to claims 1-10 above, and further in view of publication document no. XP-002129788 to Shoji et al. (hereafter "*Shoji et al.*") on the grounds set forth in paragraph 4 of the Official Action. This rejection is respectfully traversed.

*Shoji et al.* is directed to the use of oxyacid compounds of rare earth elements to make corrosion resistant layers. *Shoji et al.* is cited as allegedly teaching the use of the materials described in *Collin et al.* and *Braconnier* as a vehicle for applying corrosion-inhibiting

coatings to metal sheets. However, even if the proposed combination were appropriate, the claimed invention does not result. Namely, the teachings of *Shoji et al.* are insufficient to cure the previously noted deficiencies possessed by the principal combination of *Collin et al.* with *Braconnier*. Thus, reconsideration and withdrawal of the rejection is respectfully requested.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being obvious over *Collin et al.* in view of *Braconnier*, as applied to claims 1-10 above, and further in view of U.S. Patent No. 5,376,304 to Yamamoto et al. (hereafter "*Yamamoto et al.*") on the grounds set forth in paragraph 5 of the Official Action. This rejection is respectfully traversed.

*Yamamoto et al.* is directed to sols of cerium oxide (not cerium phosphate), that can be used as ultraviolet absorbent materials. However, even if the proposed combination were appropriate, the claimed invention would not result. Namely, *Yamamoto et al.* fails to cure the previously noted deficiencies possessed by the primary combination of *Collin et al.* with *Braconnier*. Thus, reconsideration and withdrawal of the rejection is respectfully requested.

***CONCLUSION***

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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